

FORM PTO-1390 REV. 5-93		US DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEYS DOCKET NUMBER P00,1944
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 09/720961
INTERNATIONAL APPLICATION NO. PCT/DE99/01953	INTERNATIONAL FILING DATE 1 July 1999	PRIORITY DATE CLAIMED 3 July 1998	
TITLE OF INVENTION "METHOD FOR ESTABLISHING A ROUTE VIA A COMMUNICATIONS NETWORK"			
APPLICANT(S) FOR DO/EO/US Klaus HÜNLICH			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay. 4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. 5. <input checked="" type="checkbox"/> A copy of International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) 6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input checked="" type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). 			
Items 11. to 16. below concern other document(s) or information included:			
11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98; (PTO 1449, Prior Art, Search Report).			
12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included. (SEE ATTACHED ENVELOPE)			
13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.			
14. <input type="checkbox"/> A substitute specification.			
15. <input type="checkbox"/> A change of power of attorney and/or address letter.			
16. <input checked="" type="checkbox"/> Other items or information: <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> Submittal of Drawings b. <input checked="" type="checkbox"/> EXPRESS MAIL #EL 655303064US, dated January 3, 2001. 			

09/720961

343 HSC 0761/PIU 03 JAN 2001

17. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5):**

Search Report has been prepared by the EPO or JPO \$860.00

International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) .. \$700.00

No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but
international search fee paid to USPTO (37 C.F.R. 1.445(a)(2)) \$770.00Neither international preliminary examination fee (37 C.F.R. 1.482) nor international
search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO \$1040.00International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all
claims satisfied provisions of PCT Article 33(2)-(4) \$ 96.00**ENTER APPROPRIATE BASIC FEE AMOUNT =**

CALCULATIONS

PTO USE ONLY

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months
from the earliest claimed priority date (37 C.F.R. 1.492(e)).

\$

Claims

Number Filed

Number
Extra

Rate

Total Claims

19 - 20 =

X \$ 18.00

\$.00

Independent Claims

4 - 3 =

1

X \$ 80.00

\$ 80.00

Multiple Dependent Claims

\$270.00 +

\$

TOTAL OF ABOVE CALCULATIONS =

\$ 940.00

Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must
also be filed. (Note 37 C.F.R. 1.9, 1.27, 1.28)

\$

SUBTOTAL =

\$ 940.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months
from the earliest claimed priority date (37 CFR 1.492(f)).

\$

+

TOTAL NATIONAL FEE =

\$ 940.00

Fee for recording the enclosed assignment (37 C.F.R. 1.21(h). The assignment must be
accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property

+

TOTAL FEES ENCLOSED =

\$ 940.00

Amount to be
refunded

\$

charged

\$

a. ☒ A check in the amount of \$ 940.00 to cover the above fees is enclosed.b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A
duplicate copy of this sheet is enclosed.c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 501519. A duplicate copy of this sheet is enclosed.NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be
filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Schiff Hardin & Waite
Patent Department
6600 Sears Tower
Chicago, Illinois 60606

SIGNATURE

Steven H. Noll

NAME

28,982

Registration Number

IN THE UNITED STATES ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

"PRELIMINARY AMENDMENT"

5 APPLICANT: Klaus HÜNLICH

SERIAL NO.:

EXAMINER:

FILING DATE:

ART UNIT:

INTERNATIONAL APPLICATION NO.: PCT/DE99/01953

INTERNATIONAL FILING DATE: 1 July 1999

10 INVENTION: METHOD FOR ESTABLISHING A ROUTE VIA A
COMMUNICATIONS NETWORK

Hon. Assistant Commissioner for Patents
Box PCT
Washington D.C. 20231

15 SIR:

Amend the above-identified international application before entry into the
national stage before the U.S. Patent & Trademark Office under 35 U.S.C. §371
as follows:

IN THE SPECIFICATION

20 On page 1, before the title, insert --

S P E C I F I C A T I O N

TITLE--;

after the title, insert --

09/720961-010301
PCT/PTO 03 JAN 2001

BACKGROUND OF THE INVENTION

Field of the Invention--;

in line 3, before "invention" insert --present--;

in line 5, delete ", according tot he preamble of patent claims 1 or,
5 respectively, 2, 3, 4.";

after line 5, insert --

Description of the Related Art--;

in line 23, delete "respectively,"; and

in line 25, delete "Analogous thereto" and insert --Similarly--.

10 On page 2, in line 2, replace "lacking" with --lack of--;
in line 8, delete "respectively";
in line 13, replace "To this end" with --As such--; and
in line 29, change "thereby established in the respective" to --established
in the pertinent--.

15 On substitute page 3, in line 2, delete "respectively,"; and
in line 29, delete "respectively,".

On page 4, in line 3, delete "respectively,";
after line 5, insert --

SUMMARY OF THE INVENTION--;

20 in line 6, delete "respectively,";
in lines 9 and 10, delete "with the features of patent claim 1 or,
respectively, 2, 3, 4." and insert -- by communicating a connection setup message
that includes a destination address and a source address to a network node. The
network node enters its address into the connection setup message.

The connection setup message is then forwarded via the network node that receives the connection set up message to a neighboring network node. Upon reception of the connection set up message at a destination node the connection setup message is forwarded to a destination communication terminal device.

5 A confirmation message is then returned to the source communication terminal device and switching information for messages to be subsequently transmitted between the source communication terminal and the destination communication terminal device are deposited in network nodes that are traversed.--;

in line 11, delete "comprised therein";

10 in line 13, before "only" insert --in the present invention--;

in line 17, delete "comprised therein";

in line 23, replace "The coordinated claims 2, 3, 4 are directed to a version" with --In another embodiment of the invention--;

in line 24, delete "respectively,";

15 in line 25, delete "respectively,";

in line 27, delete "respectively,";

in line 28, delete "respectively,"; and

delete lines 30 and 31.

20 On page 5, in line 1, after "One" insert --other-- and delete "defined in the subclaims";

in line 2, delete "comprised, among other things, therein" and insert --that--;

delete lines 12-14;

after line 14, insert --

25 **BRIEF DESCRIPTION OF THE DRAWINGS--;**

in line 15, after "Fig. 1" insert --shows--;

in line 17, after "Fig. 2" insert --shows--;
in line 19, after "Fig. 3" insert --shows--;
in line 23, after "Fig. 4" insert --shows--; and
after line 26, insert --

5 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--.**

On page 6, in line 1, delete "respectively,";
in line 24, delete "respectively,"; and
in line 25, delete "respectively,".

On page 13, in line 6, delete "respectively,";
10 in line 9, delete "respectively,"; and
after line 11, add the following new paragraph --

Although other modifications and changes may be suggested by those
skilled in the art, it is the intention of the inventors to embody within the patent
warranted hereon all changes and modifications as reasonably and properly come
15 within the scope of their contribution to the art.--.

IN THE DRAWINGS

Please amend Figures 1-4 to add English text for clarification as shown on
the drawing copies marked in red attached to the Request for Approval of
Drawing Changes filed simultaneously herewith.

IN THE CLAIMS

On page , line 1, change "Patent Claims" to --We Claim:--.
Please cancel all claims without prejudice and add new claims 20 through 38 :

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20. A method for establishing a route via a connection-oriented communication network with a plurality of network nodes connected to one another for emulating connectionless services, comprising the steps of:

communicating a connection setup message including a destination address and a source address to a network node, said connection set up message proceeding from a source communication terminal device;

entering a network address into the connection setup message via said network node, said network address being allocated to the network node in the communication network;

forwarding the connection setup message via the network node that receives the connection set up message to at least one neighboring network node;

forwarding the connection setup message to a destination communication terminal device upon reception of the connection set up message at a destination node, said destination node being identifiable with an assistance of the destination address; and

returning a confirmation message to the source communication terminal device on said route, said route being defined by the source address, said route also being defined by the network node address, a switching information for messages to be subsequently transmitted between the source communication terminal and the destination communication terminal device being deposited in network nodes that are traversed.

21. A method for establishing a route via a connection-oriented communication network with a plurality of network nodes connected to one another for emulating connectionless services, comprising the steps of:

communicating a connection setup message including a destination address and a source address to a network node, said connection set up message

proceeding from a source communication terminal device;

entering a network address into the connection setup message via said network node, said network address being allocated to the network node in the communication network;

forwarding the connection setup message via the network node that receives the connection set up message to at least one neighboring network node; and

returning a confirmation message to the source communication terminal device on said route upon receiving of the connection setup message at a destination node, said destination node identifiable with an assistance of the destination address, said route being defined by the source address, said route also being defined by the network node address, a switching information for messages to be subsequently transmitted between the source communication terminal and the destination communication terminal device being deposited in network nodes that are traversed.

22. A method for establishing a route via a connection-oriented communication network with a plurality of network nodes connected to one another for emulating connectionless services, comprising the steps of:

communicating a connection setup message including a destination address and a source address to a network node, said connection set up message proceeding from a source communication terminal device;

entering a network address into the connection setup message via said network node, said network address being allocated to the network node in the communication network;

forwarding the connection setup message via the network node that receives the connection set up message to at least one neighboring network node;

forwarding the connection setup message to a destination communication

terminal device upon reception of the connection set up message at a destination node, said destination node being identifiable with an assistance of the destination address; and

returning a confirmation message to a source net work node to which the source communication terminal device is allocated on said route, said route being defined by the source address, said route also being defined by the network node address, a switching information for messages to be subsequently transmitted between the source communication terminal and the destination communication terminal device being deposited in network nodes that are traversed.

23. A method for establishing a route via a connection-oriented communication network with a plurality of network nodes connected to one another for emulating connectionless services, comprising the steps of:

communicating a connection setup message including a destination address and a source address to a network node, said connection set up message proceeding from a source communication terminal device;

entering a network address into the connection setup message via said network node, said network address being allocated to the network node in the communication network;

forwarding the connection setup message via the network node that receives the connection set up message to at least one neighboring network node; and

returning a confirmation message to a source network node on said route upon receiving of the connection setup message at a destination node, said destination node identifiable with an assistance of the destination address, said route being defined by the source address, said route also being defined by the network node address, said source communication terminal device being allocated to said source network node, a switching information for messages to be

subsequently transmitted between the source communication terminal and the destination communication terminal device being deposited in network nodes that are traversed.

24. A method according to claim 20, further comprising the step of: communicating the connection setup message to a source network node, said source communication terminal device being connected to the communication network via said source network node.

25. A method according to claim 20, wherein the network node receiving the connection setup message forwards the connection setup message only to a first network node, said first network node connected to the network node receiving the connection setup message, a network node address of the first network node not being entered in the received connection setup message.

26. A method according to claim 20, wherein said network node receiving the connection setup message forwards the connection setup message to network nodes being connected to the network node receiving the connection only when a plurality of network nodes traversed by a received connection setup message is lower than an adjustable limit value.

27. A method according to claim 20, wherein in instances where a plurality of connection setup message are received at the destination communication terminal device, further comprising the steps of:

selecting one of received connection setup messages based on a predetermined criteria; and

returning said confirmation message only for a setup message selected based on said selecting step.

28. A method according to claim 27, wherein only connection setup messages that arrive within a predetermined time span after reception of a first connection setup message at the destination communication terminal device are considered for said selecting step.

29. A method according to claim 27, wherein said predetermined criteria is based on the plurality of the network nodes traversed on said route, said route being defined by the connection setup message.

30. A method according to claim 27, wherein said predetermined criteria is based on costs incurred on said route, said route being defined by the connection setup message.

30. A method according to claim 27, wherein said predetermined criteria depends on a transmission capacity made available on said route, said route being defined by the connection setup message.

31. A method according claim 20, wherein a transmission of at least one of the connection setup message and the confirmation message between neighboring network nodes ensues via a specific connection provided exclusively for transmission of at least one of the connection setup and the confirmation message.

32. A method according to claim 32, wherein at least one channel of a connecting line between two neighboring network nodes is reserved for said specific connection.

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34. A method according to claim 20, wherein an i^{th} network node receiving the connection setup message enters the network node address being allocated to said i^{th} network node in the communication network into an address field of an i^{th} address pair field of the connection setup message.

35. A method according to claim 34, wherein the network node address is the layer-3 address of the network node according to Open Systems Interconnection reference model.

36. A method according to claim 34 wherein the i^{th} network node receiving the confirmation message enters a layer-2 address into a further address field of the i^{th} address pair field of the confirmation message, said layer-2 address being allocated to said i^{th} network node communication network according to the Open Systems Interconnection reference model.

37. A method according to claim 20, wherein for a bidirectional message communication between the source communication terminal device and the destination communication terminal device the switching information being deposited sets which input of the network node is linked to which output of the network node.

38. A method according to claim 37, wherein the switching information is deleted after a predetermined time span in which no messages were transmitted between the source communication terminal device and the destination communication terminal device.

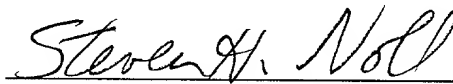
IN THE ABSTRACT

Delete lines 1 and 2;
in line 3, delete "(U-KE)";
in line 4, delete "(R)" and "(NK)";
in line 5, delete "(ATM-NK)", "(NK)" and "(R)";
in line 6, delete "(L3-NK)";
in line 7, delete "(ATM-KN)" and "(R)";
in line 8, delete "(NK)" and "(R)";
in line 9, delete "(Z-KN)" and "(E)";
in line 10, delete "(U-KE)" and "(LW)";
in line 11, delete "(NK)"; and
delete line 13.

REMARKS

The foregoing amendments to the specification and claims under Article 41 of the Patent Cooperation Treaty place the application into a form for prosecution before the U.S. Patent and Trademark Office under 35 U.S.C. §371. Accordingly, entry of these amendments before examination on the merits is hereby requested.

Respectfully submitted,



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ATTORNEY FOR APPLICANT

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- 1 -

IN THE UNITED STATES ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

"REQUEST FOR APPROVAL OF DRAWING CHANGES"

5 APPLICANT: Klaus HÜNLICH

SERIAL NO.:

EXAMINER:

FILING DATE:

ART UNIT:

INTERNATIONAL APPLICATION NO.: PCT/DE99/01953

INTERNATIONAL FILING DATE: 1 July 1999

10 INVENTION: METHOD FOR ESTABLISHING A ROUTE VIA A
COMMUNICATIONS NETWORK

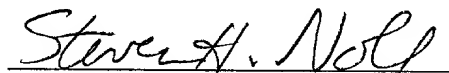
Hon. Assistant Commissioner for Patents
Box PCT
Washington D.C. 20231

15 SIR:

Applicant herewith requests approval of the drawing changes in each of
Figures 1, 2, 3 and 4, as shown on the drawing copies marked in red attached
hereto.

Respectfully submitted,

20



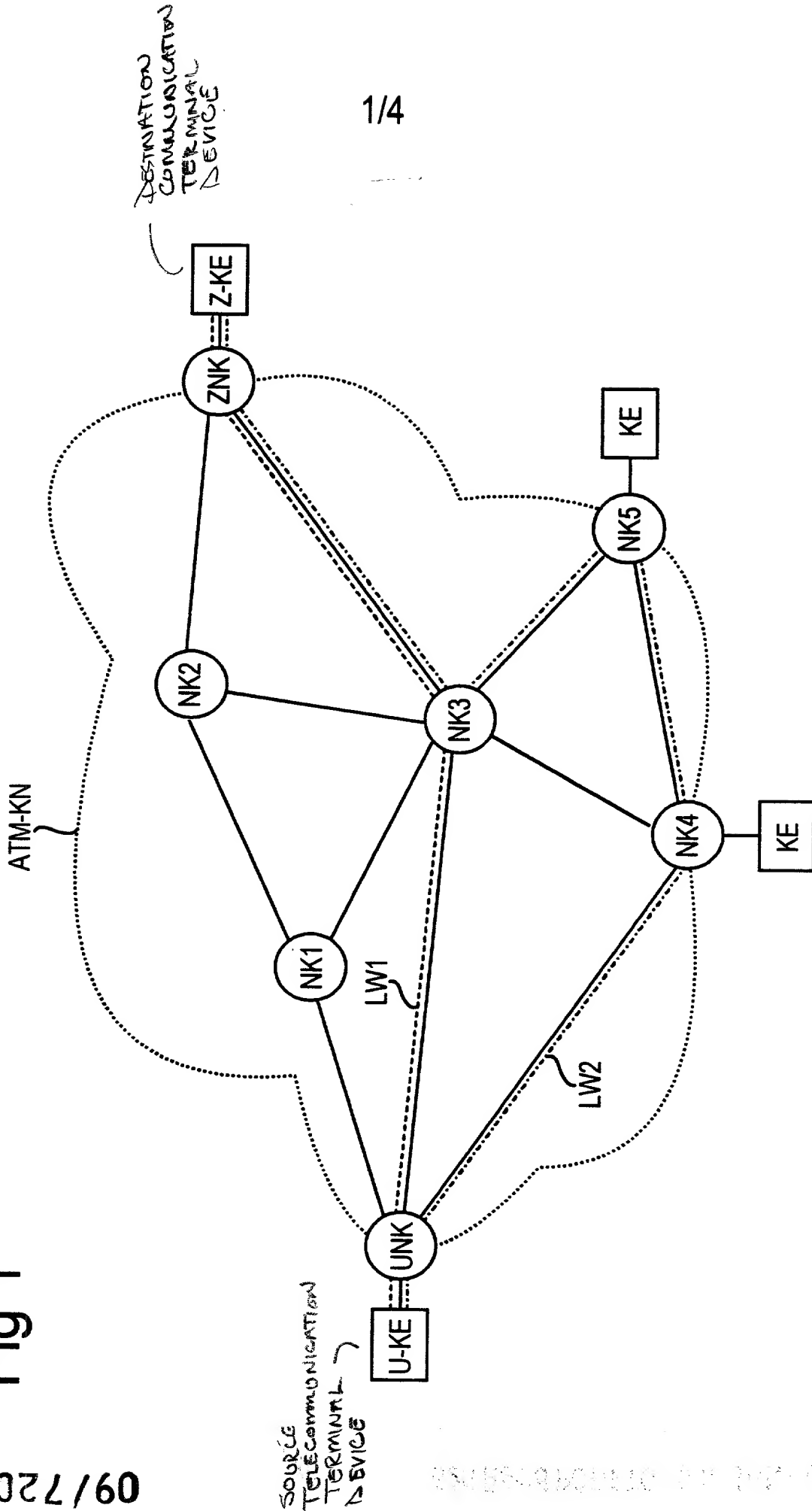
Steven H. Noll (reg. no. 28,982)
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25

ATTORNEY FOR APPLICANT

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PCT/PTO 1999/01001

Fig 1



LAYER 2 DESTINATION	LAYER 2 SOURCE ADDRESS	LAYER 2 SERVICE DATA UNIT

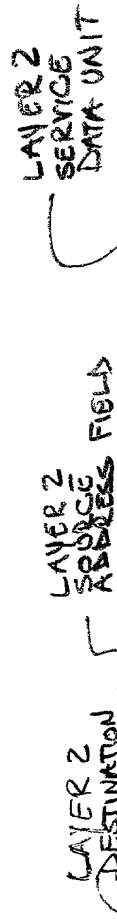


Fig 3

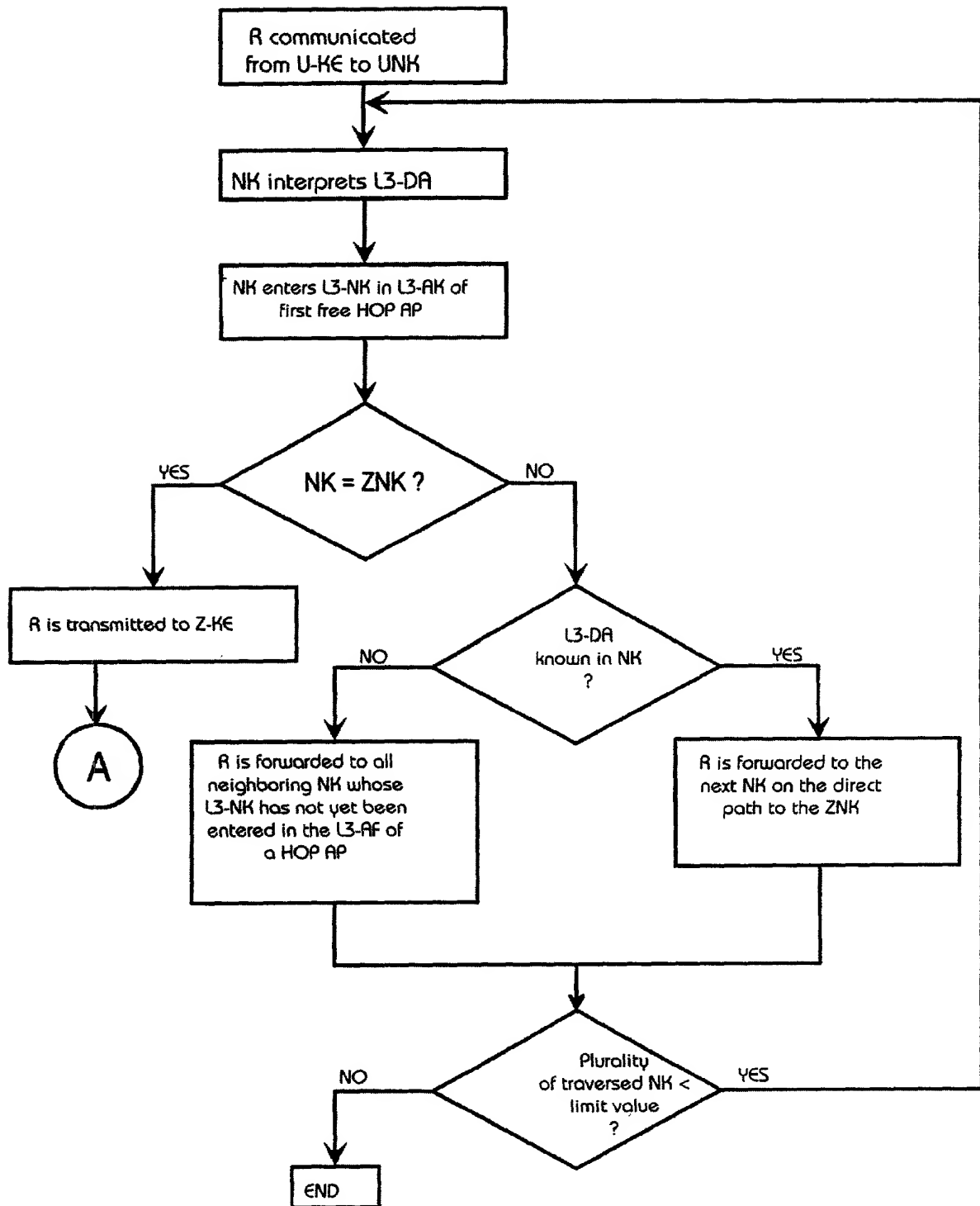
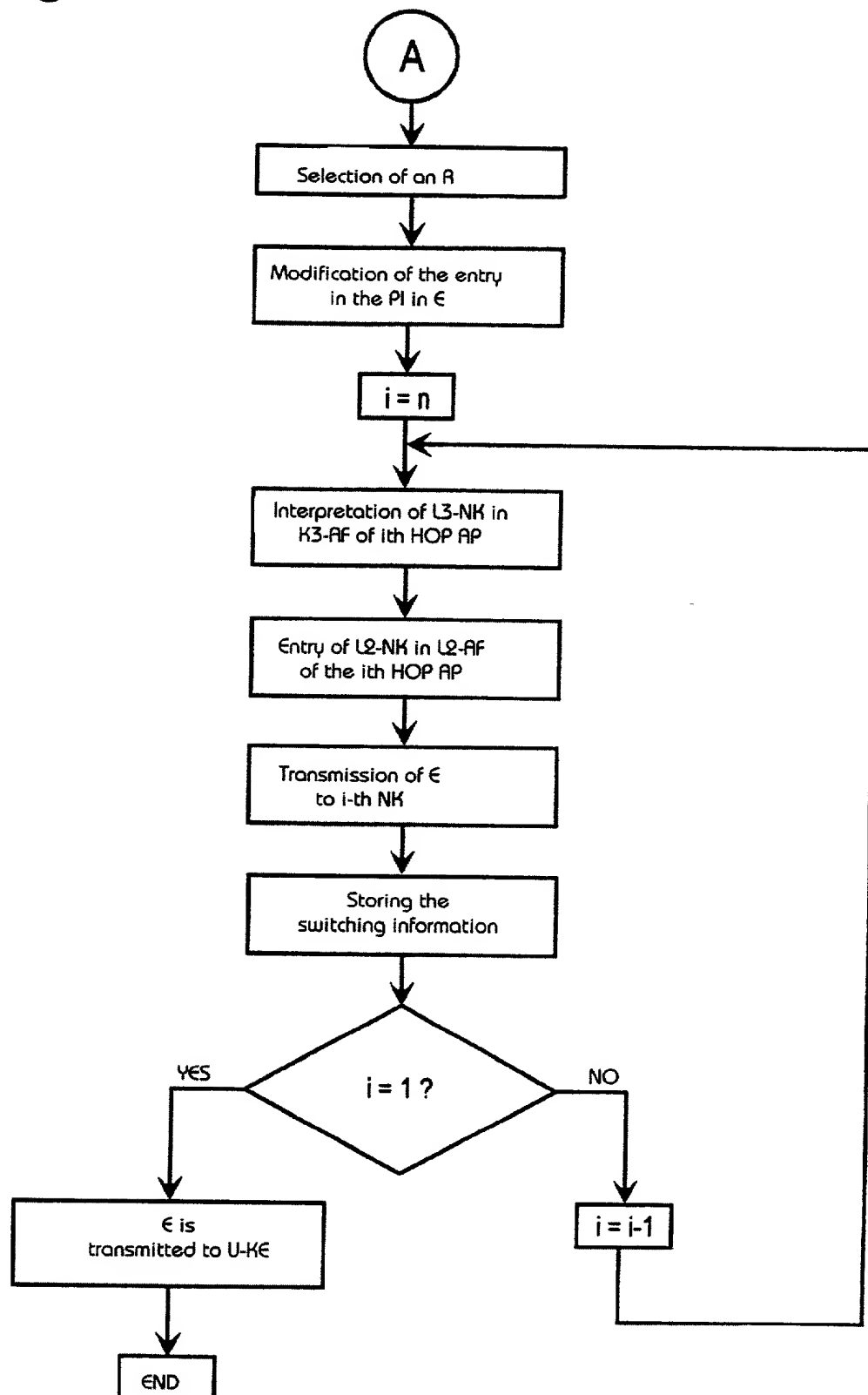


Fig 4



METHOD FOR ESTABLISHING A ROUTE VIA A COMMUNICATIONS NETWORK

The invention is directed to a method for establishing a route via a communication network comprising a plurality of network nodes connected to one another, according to the preamble of patent claims 1 or, respectively, 2, 3, 4.

In communication networks, a distinction is made between connectionless and connection-oriented communication networks dependent on the topology of the communication networks. In connectionless communication networks, a signalling phase preceding a message transmission between comm terminal devices allocated to the communication network is omitted, a communication connection between the communication terminal devices being set up in the framework of said signalling phase. In the framework of the signalling phase, a layer-3 connection (switching layer) is established according to the OSI reference model (Open Systems Interconnection), i.e. the communication connection between the communication terminal devices is established by section-by-section linking of individual layer-2 connections (security layer) according to the OSI reference model – also frequently referred to as point-to-point connection in the literature.

Connectionless communication networks are, for example, local networks – often abbreviated as LAN (Local Area Network) in the literature – with a ring or bus architecture. In a connectionless communication network, a message package to be transmitted is transmitted to each communication terminal device allocated to the communication network. The decision as to which communication terminal device further-processes or, respectively, discards the received message packet is made by the recipient of the message packet.

Analogous thereto, communication services wherein a message transmission ensues without setup of a point-to-point communication connection established in the framework of a signalling phase are referred to as connectionless services. Such connectionless services, however, can only be realized within local networks (LANs) with corresponding network topology.

In the framework of a message communication between two communication terminal devices allocated to different comm networks, the lacking signalling must be compensated by corresponding measures given a network interworking. This compensation ensues with what are referred to as routers, with
 5 which a linking of communication networks with different network topology is realized.

With respect to its critical function, a router realizes the layer 3 (switching layer) of the OSI reference model, whereby networks with respectively different topology of the layers 1 (bit transmission layer) and 2 (security layer) are physically
 10 connected with the assistance of a router. In order to switch message packets between the networks connected to a router, the address particulars contained in routing information of the message packets – particularly a destination and a source address – are interpreted and evaluated by a control means located in the router. To this end, the router evaluates the layer-3 addresses contained in a message packet to be
 15 transmitted and converts these into corresponding layer-2 addresses. The layer-2 connections (i.e. the connections to be respectively established between two network nodes arranged in a network) required for a layer-3 connection (i.e. for the terminal device connection between the communication terminal devices) are established on the basis of these layer-2 addresses. Subsequently, the message packets are converted
 20 protocol-suited for a transmission and are transmitted via the layer-2 connections that have been established.

In the framework of a message transmission via an ATM-based communication network (Asynchronous Transfer Mode), a signalling phase preceding the message transmission between is required for setting up a communication
 25 connection between two communication terminal devices, i.e. an ATM-based communication network is a connection-oriented communication network.

Before the beginning of the message transmission, connection tables with switching information composed of a virtual channel identification and of a virtual path identification are thereby established in the respective ATM network node in an
 30 ATM-based communication network. In the connection tables, a VCI value is allocated to the virtual channel identification and a VPI value is allocated to the

virtual path identification. The switching information entered in the connection tables define how the virtual paths -- or, respectively, virtual transmission channels contained in the virtual paths -- of the incoming and outgoing connections at an ATM network node are allocated to one another by the signalling, i.e. which input is
5 connected to which output in switching-oriented terms.

For example, European Published Application EP 0 406 842 A2 discloses a communication network based on the asynchronous transfer mode, whereby switching information in the framework of a signalling phase are entered in the traversed network nodes of the communication network with a connection setup
10 message communicated from a source to a destination communication terminal device and a confirmation message subsequently communicated from the destination to the source communication terminal device.

In the cell-based data transmission method known as asynchronous transfer mode (ATM), data packets of a fixed length, what are referred to as ATM
15 cells, are used for the data transport. An ATM cell is composed of a five byte long cell header -- what is referred to as the header -- containing switching data relevant for the transport of an ATM cell and of a 48 byte long payload cell, what is referred to as the payload. ATM cells transmitted via the virtual connections essentially comprise switching data composed of a VPI value and a VCI value in the cell header. The data
20 deposited in the header are processed at the input of an ATM network node, i.e. the switching data arranged therein are acquired and interpreted. Subsequently, the ATM cells are switched to an output representing a specific destination on the basis of the switching information stored in the connection table, being switched thereto by a switching network module arranged in the ATM network node.

25 In order to be able to emulate connectionless services in an ATM-based communication network, a conversion of the switching data deposited in the cell header of a communicated ATM cell must ensue in every ATM network node arranged in the ATM-based communication network, so that the required switching capacity or, respectively, calculating performance increases greatly in an ATM
30 network node. Given an increased data volume, this can lead to a communication delay - often referred to as "delay" in the literature -, so that, for example,

connectionless services cannot be utilized within the scope of applications having real-time demands.

- 5 In order to reduce the required calculating outlay in an ATM network node, "ATM networks - concepts, protocols, applications", Addison-Wesley, 3rd edition, 1998, ISBN 0-201-17817-6 discloses that connectionless services be realized via specific, what are referred to as "CL servers" (Connection Less Server). These CL servers are connected to one another and undertake the address conversions needed

for an emulation of connectionless services in an ATM-base communication network analogous to the methods that are implemented in routers. Given the methods employed here, however, a processing or, respectively, communication delay can also arise given an elevated data volume.

5 The present invention is based on the object of specifying a method wherein the processing or, respectively, communication delay is reduced in an emulation of connectionless services via a connection-oriented communication network.

10 This object is inventively achieved with the features of patent claim 1 or, respectively, 2, 3, 4.

15 A critical advantage of the invention is comprised therein that, in contrast to the prior art wherein switching information for all network nodes arranged in the communication network are stored in a network node, only those switching information are stored in the network nodes of the communication network that are required for the connections currently conducted over the network node. This leads to a considerable reduction of the memory capacity required in the network node.

20 Another advantage of the invention is comprised therein that, given the present method for route determination and in contrast to the signaling in a connection-oriented communication network, no transmission conditions such as, for example, a declaration about the required transmission capacity or about real-time demands are made, so that a route determination and a subsequent message communication can be realized faster.

25 The coordinated claims 2, 3, 4 are directed to a version of the invention wherein a connection setup message or, respectively, a confirmation message is not forwarded up to the originating or, respectively, destination communication terminal device participating in a connection but is processed in the network node allocated to the originating or, respectively, destination communication terminal device. This has the advantage that the source or, respectively, the destination communication terminal device can be kept free of routing jobs.

30 Advantageous developments of the invention are indicated in the subclaims.

One advantage of developments of the invention defined in the subclaims is comprised, among other things, therein a decision about the selection of a route between a source communication terminal device and a destination communication terminal device can be made by the subscriber at the destination communication terminal device, so that the criteria for a connection setup relevant to said subscriber such as, for example, the transmission time, the costs or the transmission capacity made available on the identified route take effect.

As a result of a deletion of switching information stored in a network node after expiration of a prescribable time span (for example, after 10 minutes) wherein no messages allocated to these switching information were communicated, assures that only the currently acquired switching information are stored in a network node.

An exemplary embodiment of the invention is explained in greater detail below with reference to the drawing.

Thereby shown are:

- 15 Fig. 1 a structogram directed to the schematic illustration of an ATM-based communication network with network nodes arranged therein;
- Fig. 2 a structogram directed to the schematic illustration of a connection setup message or, respectively, a confirmation message;
- Fig. 3 a flow chart for illustrating the method steps sequencing in a communication of a connection setup message from a source communication terminal device to a destination communication terminal device;
- 20 Fig. 4 a flow chart for illustrating the method steps sequencing given a communication of a confirmation message from the destination communication terminal device to the source communication terminal device.
- 25

Figure 1 shows a schematic illustration of an ATM-based communication network ATM-KN having network nodes NK arranged therein and connected to one another. The network nodes NK are realized, for example, by ATM switching systems to which communication terminal devices can be connected. By way of example, two communication terminal devices KE are shown that are connected via a

fourth network node NK4 or, respectively, via a fifth network node NK5 to the ATM-based communication network ATM-KN.

Further, a source communication terminal device U-KE is connected to the ATM-based communication network ATM-KN via a network node NK - referred to as source network node UNK below - and a destination communication terminal device Z-KE is connected to the ATM-based communication network ATM-KN via a further network node NK - referred to below as destination network node ZNK. Proceeding from the source communication terminal device U-KE, a message is to be communicated to the destination communication terminal devices Z-KE via the ATM-based communication network ATM-KN.

To this end, a connection setup message R is communicated from the source communication terminal device U-KE to the source network node UNK for a determination of a route from the source communication terminal device U-KE to the destination communication device Z-KE. The individual network nodes NK are connected to one another via a specific connection for the communication of connection setup messages to a neighboring network node NK. For example, a specific transmission channel - frequently abbreviated in the literature as VC (Virtual Channel) - is reserved for the communication of connection setup messages R. A connection setup message R can be communicated to the destination communication terminal devices ZK-E from the source communication terminal device U-KE via various routes LW. For example, a first route LW1 and a second route LW2 are shown with broken lines in the Figure.

Figure 2 shows a schematic illustration of a connection setup message R (Request) or, respectively, of a confirmation message E (Established). The connection setup message R or, respectively, the confirmation message E is composed of a layer-2 destination address field L2-DA (Layer 2 - Destination Address), of a layer-2 source address field L2-SA (Layer 2 - Source Address) and of a service data field L2-SDU (Layer 2 - Service Data Unit). In the present example, the layer-2 destination address field L2-DA contains the layer-2 address L2-Z-KE according to the OSI reference model of the destination communication terminal device Z-KE and the layer-2 source address field L2-SA contains the layer-2 address L2-U-KE

according to the OSI reference model of the source communication terminal device U-KE.

The service data field L2-SDU is subdivided into a layer-3 destination address field L3-DA, into a layer-3 source address field L3-SA, into a protocol info-field PI and into n address pair fields 1.HOP AP,...,n.HOP AP. In the present example, the layer-3 destination address field L3-DA contains the layer-3 address L3-Z-KE according to the OSI reference model of the destination communication terminal device Z-KE, and the layer-3 source address field L3-SA contains the layer-3 address L3-U-KE according to the OSI reference model of the source communication terminal device U-KE.

The protocol info-field PI serves to distinguish between connection setup message R and confirmation message E and alternatively contains an "R" or an "E" as entry. When the protocol info-field PI exhibits an "R" as entry, then it is a matter of a connection setup message R. When the protocol info-field PI exhibits an "E" as entry, then it is a matter of a confirmation message B.

The address pair fields 1.HOP AP,...,n.HOP AP are respectively subdivided into a layer-3 address field L3-AF and into a layer-2 address field L2-AF. The layer-3 address is L3-NK are stored in the address field pairs 1.HOP AP,...,n.HOP AP in the layer-3 address field L3-AF and the layer-2 addresses L2-NK of the network nodes NK traversed on a route LW are stored therein in the layer-2 address field L2-AF.

A connection setup message R communicated via the first route LW1 from the source communication terminal device U-KE to the destination communication terminal device Z-KE contains three valid address pair fields 1.HOP AP,...,3.HOP AP. The first address pair field 1.HOP AP contains the layer-3 address L3-UNK of the source network node UNK. The second address pair field 2.HOP AP contains the slice-3 address L3-NK3 of the third network node NK3. The third address pair field 3.HOP AP contains the layer-3 address L3-ZNK of the destination network node ZNK.

A connection setup message R communicated via the second route LW2 from the source communication terminal device U-KE to the destination

communication terminal device Z-KE contains five valid address pair fields 1.HOP AP,...,5.HOP AP. The first address pair field 1.HOP AP contains the layer-3 address L3-UNK of the source network node UNK. The second, third and fourth address pair field 2.HOP AP, 3.HOP AP, 4.HOP AP contain the layer-3 addresses L3-NK4, L3-NK5, L3-NK3 of the fourth, fifth and third network node NK4, NK5, NK3. The fifth address pair field 5.HOP AP contains the layer-3 address L3-ZNK of the destination network node ZNK.

Figure 3 shows a flow chart for illustrating the method steps sequencing in a communication of a connection setup message R from the source communication terminal device U-KE to the destination communication terminal device Z-NKE.

When, proceeding from the source communication terminal device U-KE, a message is to be communicated to the destination communication terminal device Z-KE, then the source communication terminal device U-KE sends a connection setup message R to the source network node UNK via the pre-defined transmission channel. The network node NK receiving a connection setup message R interprets the destination address L3-Z-KE of the destination communication terminal device Z-KE deposited in the layer-3 destination address field L3-DA and enters the layer-3 address L3-NK allocated to it in the ATM-based communication network ATM-KN in the layer-3 address field L3-AF of the first free address pair field 1.HOP AP, n.HOP AP.

When the network node NK is the source network node UNK, then the source network node UNK enters the layer-3 address L3-UNK in the layer-3 address field L3-AF of the first address pair field 1.HOP AP.

In a next step, a check is carried out to see whether the network node NK that has received a connection setup message R, is the destination network node ZNK.

When this is the case, the connection setup message R is communicated directly to the destination communication terminal device Z-KE via the pre-defined transmission channel. The method steps sequencing in this case are explained in greater detail with reference to Figure 4. When the network node NK is not the destination network node ZNK, then a check is carried out to see whether the destination address L3-Z-KE of the destination communication terminal device Z-KE deposited in the layer-3 destination address field L3-DA is known in the network node NK. When this is the

case, then the connection setup message R is forwarded via the pre-defined transmission channel to the next network node NK lying on the direct route to the destination network node ZNK.

When the destination address L3-Z-KE is not known in the network node NK, then the connection setup message R is forwarded via the pre-defined transmission channels to all neighboring network nodes NK whose layer-3 addresses L3-NK are not entered in a layer-3 address field L3-AF of an address pair field 1.HOP AP,..., n.HOP AP. This measure prevents loop formations from occurring in the determination of a route LW.

Before a transmission of the connection setup message R to a further network node NK, the plurality of network nodes NK previously traversed by the connection setup message R is determined, i.e. the plurality of entries in a layer-3 address field L3-AF of the address pair field s 1.HOP AP,...,n.HOP AP. When the plurality has reached an adjustable limit value, then the connection setup message R is discarded. This measure assures that the transmission resources made available by the ATM-based communication network ATM-KN are not unnecessarily occupied in the determination of a route LW.

Figure 4 shows a flow chart for illustrating the method steps sequencing given a transmission of a confirmation message E from the destination communication terminal device Z-KE to the source communication terminal device U-KE. When the destination communication terminal Z-KE has received a plurality of connection setup messages R within a prescribable time span, a connection setup message R is selected according to prescribable criteria. For example, the transmission duration of a connection setup message R, the number of network nodes NK traversed on the route LW defined by the connection setup message R, the costs incurred due to the route LW or the transmission capacity made available on the route LW are selected as criteria for the selection for a connection setup message R. Alternatively, combinations of these criteria can also be utilized for the selection of a connection setup message R.

After the selection of a connection setup message R, the other connection setup messages R are discarded and the selected connection setup message R is

converted into a confirmation message E by modifying the entry in the protocol info-field PR from "R" to "E".

In a next step, the layer-3 address L3-NK is interpreted in the layer-3 address field L3-AF of the n. address pair field n.HOP AP, and the layer-2 address L2-NK of the network node NK referenced by this address is entered in the layer-2 address field L2-AF of the n.address pair field n.HOP AP. In this case, the network node NK is the destination network node ZNK. Subsequently, the confirmation message E, proceeding from the destination communication terminal device Z-KE via the pre-defined transmission channel, is communicated to the network node NK - the destination network node ZNK in this case - referenced by the layer-3 address L3-NK deposited in the layer-3 address field L3-AF of the n.address pair field n.HOP AP. A switching information is stored in the network node NK for a following message communication between the source communication terminal device UK-KE and the destination communication terminal device Z-KE. This switching information composed of an input VCI value and an output VCI value indicates which input channel is connected to which output channel of the network node in switching-oriented terms.

When the network node NK is a member of the source network UNK, i.e. when $n = 1$, then the confirmation message is forwarded via the predefined transmission channel directly to the source communication terminal device U-KE. When the network node NK is not the source network node UNK, the layer-3 address L3-NK in the layer-3 address field L3-AF of the n-first address pair field n-1.HOP AP is interpreted in a next step, and the layer-2 address L2-NK of the network node NK referenced by this address is entered in the layer-2 address field L2-AF of the n-1.address pair field n-1.HOP AP. Subsequently, the confirmation message E is communicated via the predefined transmission channel to the network node NK referenced by the layer-3 address L3-NK deposited in the layer-3 address field L3-AF of the n-1.address pair field n-1.HOP AP, and the switching information needed for a subsequent message communication between the source communication terminal device U-KE and the destination communication terminal device Z-KE and composed of input VCI value and output VCI value is stored.

These method steps are repeated until the confirmation message E reaches the source network node UNK, proceeding from which it is communicated via the predefined transmission channel to the source communication terminal device U-KE.

When, given the present exemplary embodiment, for example, the plurality n of network nodes NK traversed on a route LW forms the basis as criterion for a selection of a connection setup message R at the destination communication terminal equipment Z-KE, then the connection setup message R representing the first route LW1 is selected and converted into a confirmation message E. The connection setup message R representing the second route LW2 is discarded.

The layer-3 address L3-ZNK in the layer-3 address field L3-AF of the third address pair field 3.HOP AP is interpreted in the destination communication terminal device Z-KE, and the layer-2 address L2-ZNK of the destination network node ZNK indicated by the layer-3 address L3-ZNK is entered in the layer-2 address field L2-AF of the third address pair field 3.HOP AP. Subsequently, the confirmation message E is communicated proceeding from the destination communication terminal device ZKE via the predefined transmission channel to the destination network node ZNK. The switching information composed of input VCI value and output VIC value that is relevant for a subsequent message transmission is stored in the destination network node. In a next step, the layer-3 address L3-NK3 in the layer-3 address field N3-AF of the second address pair field 2.HOP AP is interpreted, and the layer-2 address L2-NK3 of the third network node NK3 referenced by the layer-3 address L3-NK3 is entered in the layer-2 address field L2-AF of the second address pair field 2.HOP AP. Subsequently, the confirmation message E is communicated to the third network node NK3 via the predefined transmission channel proceeding from the destination network node Z-NK, the switching information relevant for a subsequent message communication being stored in said third network node NK3. In a further step, the layer-3 address L3-UNK in the layer-3 address field L3-AF of the first address pair field 1.HOP AP is interpreted, and the layer-2 address L2-UNK of the source network node UNK referenced by the layer-3 address L3-UNK is entered in the layer-2 address field L2-AF of the first address pair field 1.HOP AP. Subsequently, the confirmation message E is communicated to the source network

node NK3 via the predefined transmission channel proceeding from the third network node NK3, the switching information relevant for a subsequent message communication being stored in said source network node NK3. In a final step, the confirmation message E is communicated via the predefined transmission channel to the source communication terminal device U-KE.

When no messages are communicated via the connection between the source communication terminal device U-KE and the destination communication terminal device Z-KE allocated to the switching information stored in a network node NK within an adjustable time span, for example with a time span of 10 minutes, then this switching information is deleted. It is thus assured that the switching information stored in a network node NK are constantly updated.

In contrast to the traditional signaling in an ATM-based communication network ATM-KN, wherein switching information for a message transmission to a further network node NK arranged in the ATM-based communication network ATM-KN must be stored in every switching node NK, only those switching information that are required for the connections currently conducted across the network node NK are stored in a network node NK given the disclosed method for route determination. This leads to a considerable reduction of the required address memory capacity in the network node NK and to an increase in the switching speed.

In contrast to the traditional signaling or in the route LW between the source communication terminal device U-KE and the destination communication terminal device Z-KE is predetermined by switching information stored in the source network node UNK, further, a selection of a route LW between the source communication terminal device U-KE and the destination communication terminal device Z-KE is undertaken by the subscriber at the destination communication terminal device Z-KE. Thus, criteria for a connection setup such as, for example, the transmission time, the costs incurred by a route LW or the transmission capacity made available on a route LW that are relevant for the subscriber can thus be taken into consideration situation-condition.

In the present method for route determination and in contrast to the traditional signaling in an ATM-based communication network ATM-KN, no

Patent Claims

1. Method for establishing a route (LW) via a communication network (ATM-KN) comprising a plurality of network nodes (NK) connected to one another, characterized in that
 - 5 a connection setup message (R) containing a destination and a source address (L3-DA; L3-SA) is communicated to a network node (NK) proceeding from a source communication terminal device (U-KE);
 - the network node (NK) enters the network address (L3-NK) allocated to it in the communication network (ATM-KN) into the connection setup message (R);
 - 10 a network node (NK) receiving the connection setup message (R) forwards this to at least one neighboring network node (NK);
 - the connection setup message (R) is forwarded to a destination communication terminal device (Z-KE) upon reception of the connection setup message (R) at a destination node (ZNK) identifiable with the assistance of the destination address (L3-DA); and in that
 - 15 a confirmation message (E) is returned to the source communication terminal device (U-KE) on the route (LW) defined by the source address (L3-SA) and by the entered network node addresses (L3-NK), whereby a switching information for messages to be subsequently transmitted between the source and the destination communication
 - 20 terminal device (U-KE; Z-KE) is deposited in the network nodes (NK) that are traversed.
2. Method for establishing a route (LW) via a communication network (ATM-KN) comprising a plurality of network nodes (NK) connected to one another, characterized in that
 - 25 a connection setup message (R) containing a destination and a source address (L3-DA; L3-SA) is communicated to a network node (NK) proceeding from a source communication terminal device (U-KE);
 - the network node (NK) enters the network address (L3-NK) allocated to it in the communication network (ATM-KN) into the connection setup message (R);
 - 30 a network node (NK) receiving the connection setup message (R) forwards this to at least one neighboring network node (NK);

upon reception of the connection setup message (R) at a destination node (ZNK) identifiable with the assistance of the destination address (L3-DA), a confirmation message (E) is returned to the source communication terminal device (U-KE) on the route (LW) defined by the source address (L3-SA) and by the entered network node addresses (L3-NK), whereby a switching information for messages to be subsequently transmitted between the source and the destination communication terminal device (U-KE; Z-KE) is deposited in the network nodes (NK) that are traversed.

3. Method for establishing a route (LW) via a communication network (ATM-KN) comprising a plurality of network nodes (NK) connected to one another, characterized in that

a connection setup message (R) containing a destination and a source address (L3-DA; L3-SA) is communicated to a network node (NK) proceeding from a source communication terminal device (U-KE);

the network node (NK) enters the network address (L3-NK) allocated to it in the communication network (ATM-KN) into the connection setup message (R);

a network node (NK) receiving the connection setup message (R) forwards this to at least one neighboring network node (NK);

the connection setup message (R) is forwarded to a destination communication terminal device (Z-KE) upon reception of the connection setup message (R) at a destination node (ZNK) identifiable with the assistance of the destination address (L3-DA); and in that

a confirmation message (E) is returned to a source network node (UNK), to which the source communication terminal device (U-KE) is allocated, on the route (LW) defined by the source address (L3-SA) and by the entered network node addresses (L3-NK), whereby a switching information for messages to be subsequently transmitted between the source and the destination communication terminal device (U-KE; Z-KE) is deposited in the network nodes (NK) that are traversed.

4. Method for establishing a route (LW) via a communication network (ATM-KN) comprising a plurality of network nodes (NK) connected to one another, characterized in that

a connection setup message (R) containing a destination and a source address (L3-DA; L3-SA) is communicated to a network node (NK) proceeding from a source communication terminal device (U-KE);

the network node (NK) enters the network address (L3-NK) allocated to it in the communication network (ATM-KN) into the connection setup message (R);

a network node (NK) receiving the connection setup message (R) forwards this to at least one neighboring network node (NK);

upon reception of the connection setup message (R) at a destination node (ZNK) identifiable with the assistance of the destination address (L3-DA), a confirmation

message (E) is returned to a source network node (UNK), to which the source communication terminal device (U-KE) is allocated, on the route (LW) defined by the source address (L3-SA) and by the entered network node addresses (L3-NK), whereby a switching information for messages to be subsequently transmitted between the source and the destination communication terminal device (U-KE; Z-KE) is deposited in the network nodes (NK) that are traversed.

5. Method according to one of the preceding claims, characterized in that the source communication terminal device (U-KE) communicates the connection setup message (R) to a source network node (UNK) via which the source communication terminal device (U-KE) is connected to the communication network (ATM-KN).

6. Method according to one of the preceding claims, characterized in that a network node (NK) receiving the connection setup message (R) forwards this only to the network node (NK) connected to it whose network node address (L3-NK) is not entered in the received connection setup message (R).

7. Method according to one of the preceding claims, characterized in that the network node (NK) receiving the connection setup message (R) forwards this to the network nodes connected to it only when the plurality of network nodes (NK) traversed by the received connection setup message (R) is lower than an adjustable limit value.

8. Method according to one of the preceding claims, characterized in that, in instances wherein a plurality of connection setup message (R) are received at the

destination communication terminal device (Z-KE), one of the received connection setup messages (R) is selected on the basis of prescribable criteria; and in that a corresponding confirmation message is returned only for the selected connection setup message (R).

5 9. Method according to claim 8, characterized in that only connection setup messages (R) that arrive within a prescribable time span after reception of a first connection setup message (R) at the destination communication terminal device (Z-KE) are considered for a selection.

10 10. Method according to claim 8 or 9, characterized in that the selection of a connection setup message (R) ensues dependent on the plurality (n) of network nodes (NK) traversed on the route (LW) defined by the connection setup message (R).

11. Method according to one of the claims 8 through 10, characterized in that the selection of a connection setup message (R) ensues dependent on the costs incurred on the route (LW) defined by the connection setup message (R).

15 12. Method according to one of the claims 8 through 11, characterized in that the selection of a connection setup message (R) ensues dependent on the transmission capacity made available on the route (LW) defined by the connection setup message (R).

20 13. Method according to one of the preceding claims, characterized in that a transmission of the connection setup message (R) or, respectively, of the confirmation message (E) between neighboring network nodes (NK) ensues via a specific connection provided exclusively for a transmission of the connection setup or, respectively, of the confirmation message (R; E).

25 14. Method according to claim 13, characterized in that at least one channel (VC) of a connecting line between two neighboring network nodes (NK) is reserved for the specific connection.

30 15. Method according to one of the preceding claims, characterized in that the i^{th} network node (NK) receiving the connection setup message (R) enters the network node address (L3-NK) allocated to it in the communication network (ATM-KN) into an address field of an i^{th} address pair field (HOP-AP) of the connection setup message (R).

16. Method according to claim 15, characterized in that the network node address (L3-NK) is the layer-3 address of the network node (NK) according to the OSI reference model (Open Systems Interconnection).

5 17. Method according to claim 15 or 16, characterized in that the i^{th} network node (NK) receiving the confirmation message (E) enters the layer-2 address (L3-NK) allocated to it in the communication network (ATM-KN) according to the OSI reference model into a further address field of the i^{th} address pair field (HOP-AP) of the confirmation message (E).

10 18. Method according to one of the preceding claims, characterized in that, upon reception of the confirmation message (E) in a network node (NK), a switching information is deposited that sets which input of the network node (NK) is linked to which output of the network node (NK) for a bidirectional message communication between the source and the destination communication terminal device (U-KE; Z-KE).

15 19. Method according to claim 18, characterized in that the switching information is deleted after a prescribable time span wherein no messages were transmitted between the source and the destination communication terminal device (U-KE; Z-KE).

Method for Establishing a Route via a Communications Network

5
10

Figure 1

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"CHANGE OF ADDRESS OF APPLICANT'S REPRESENTATIVE"

APPLICANT: Klaus HÜNLICH

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INTERNATIONAL FILING DATE: 1 July 1999

INVENTION: METHOD FOR ESTABLISHING A ROUTE VIA A
COMMUNICATIONS NETWORK

Hon. Assistant Commissioner for Patents
Washington, D.C. 20231

SIR:

Members of the firm of Hill & Simpson designated on the original Power of Attorney have merged into the firm of Schiff Hardin & Waite. All future correspondence for the above-referenced application therefore should be sent to the following address:

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09/720961 03 JAN 2001

Fig 1

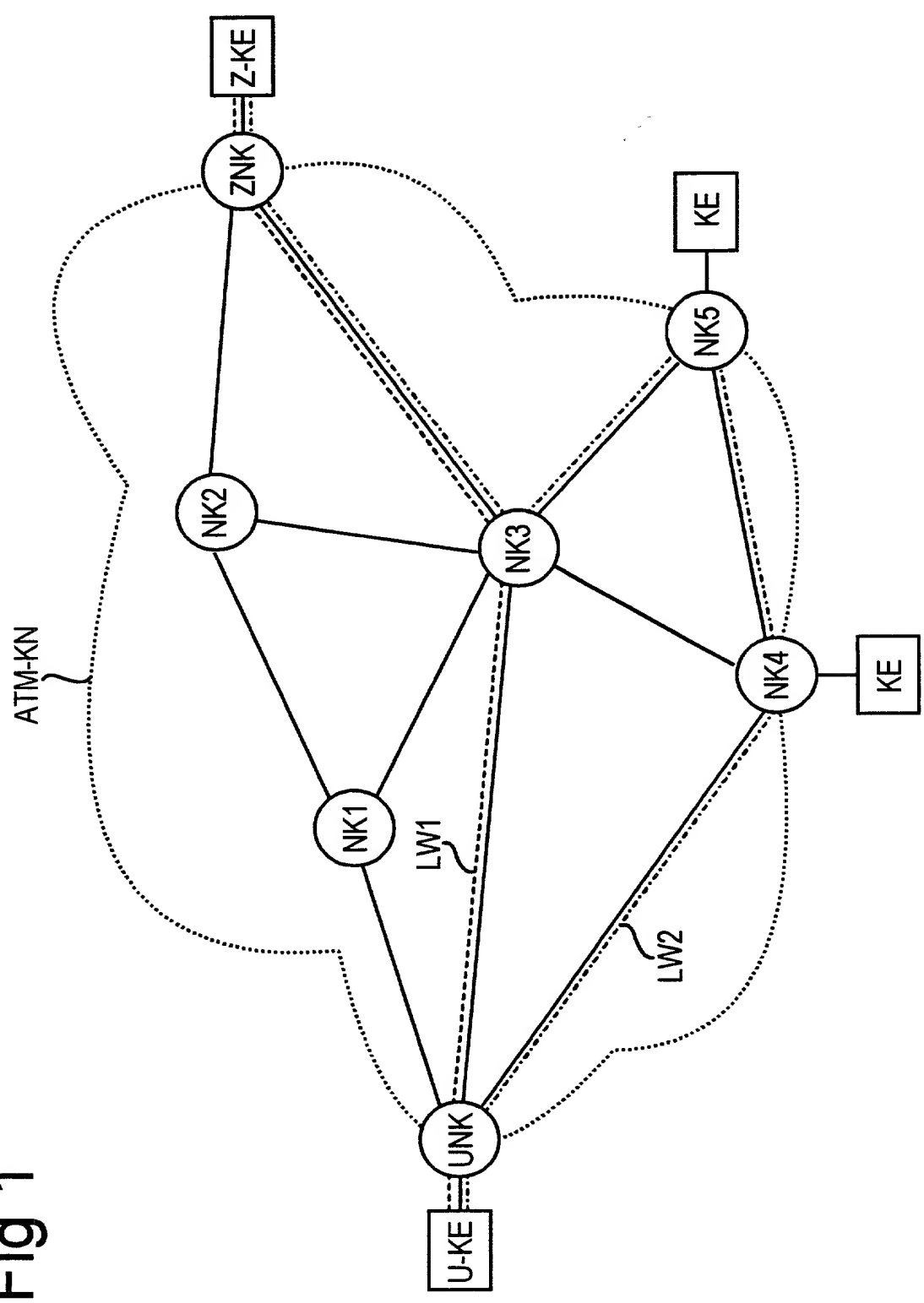


Fig 2

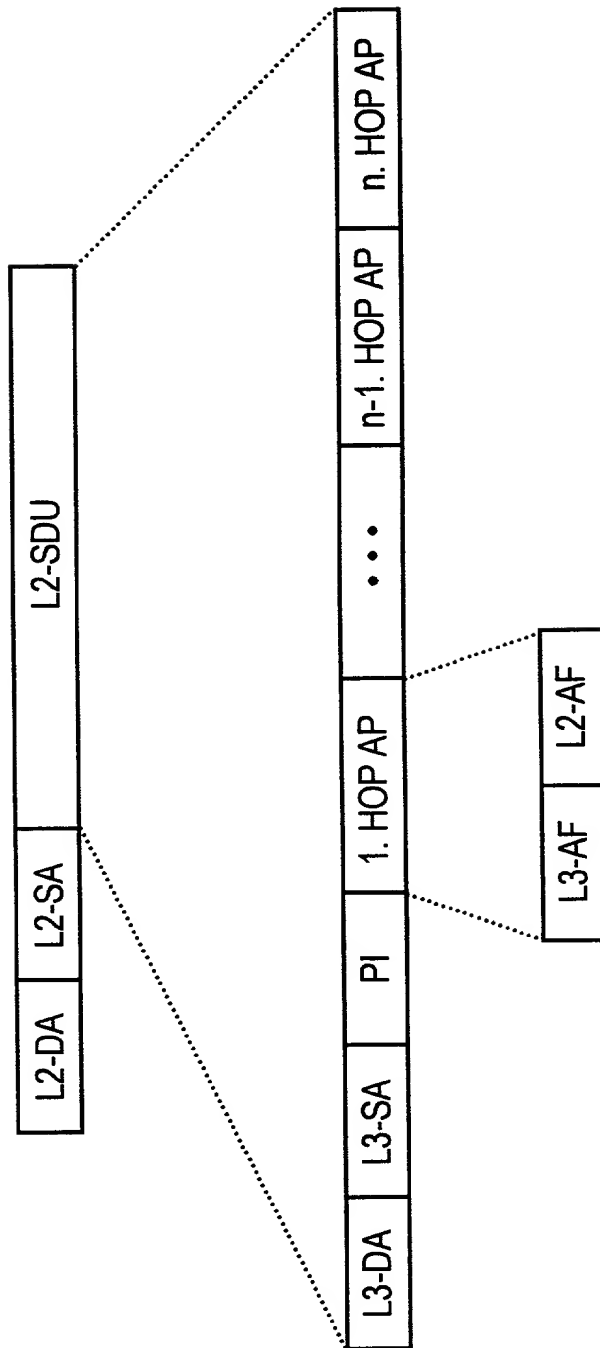
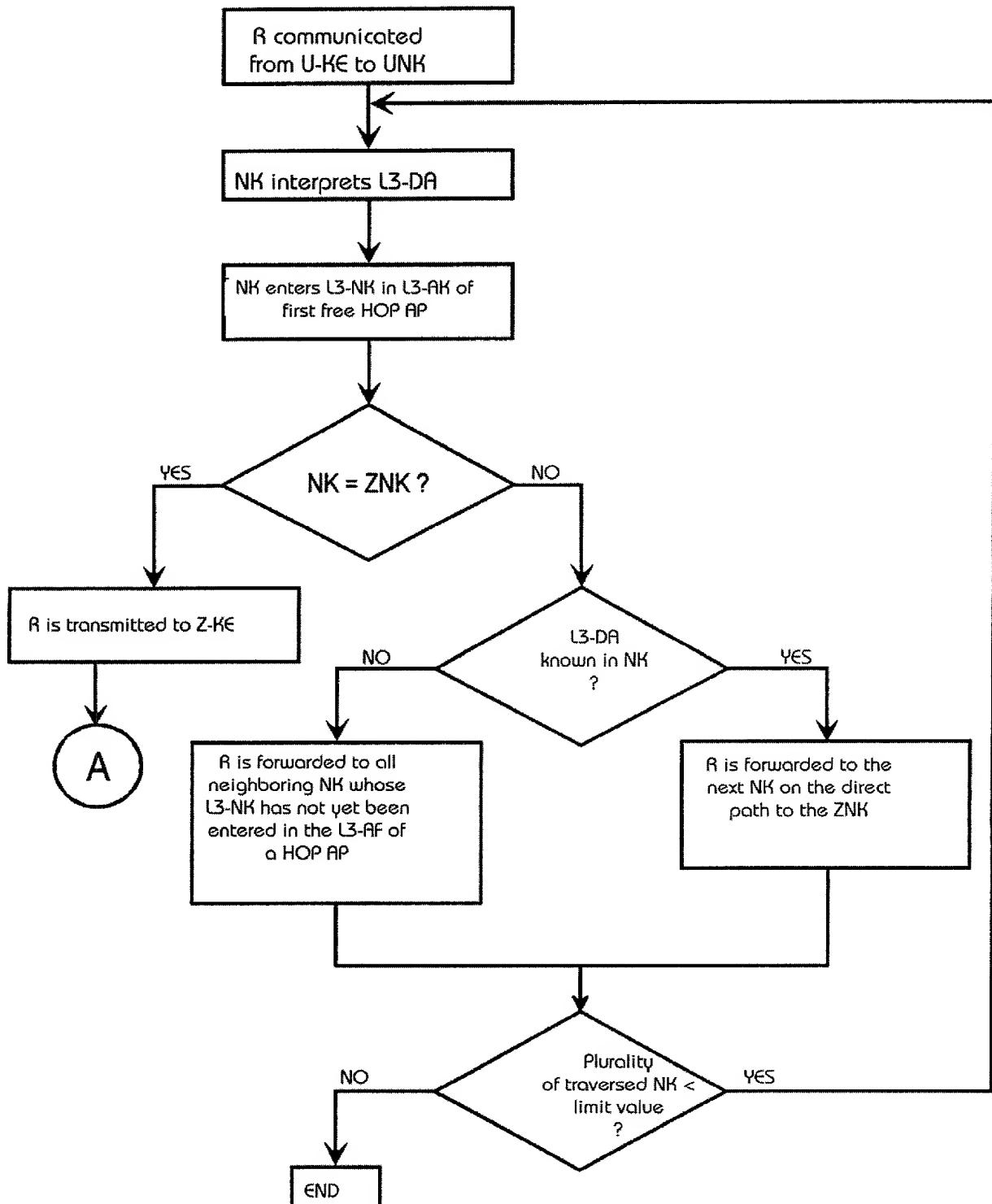
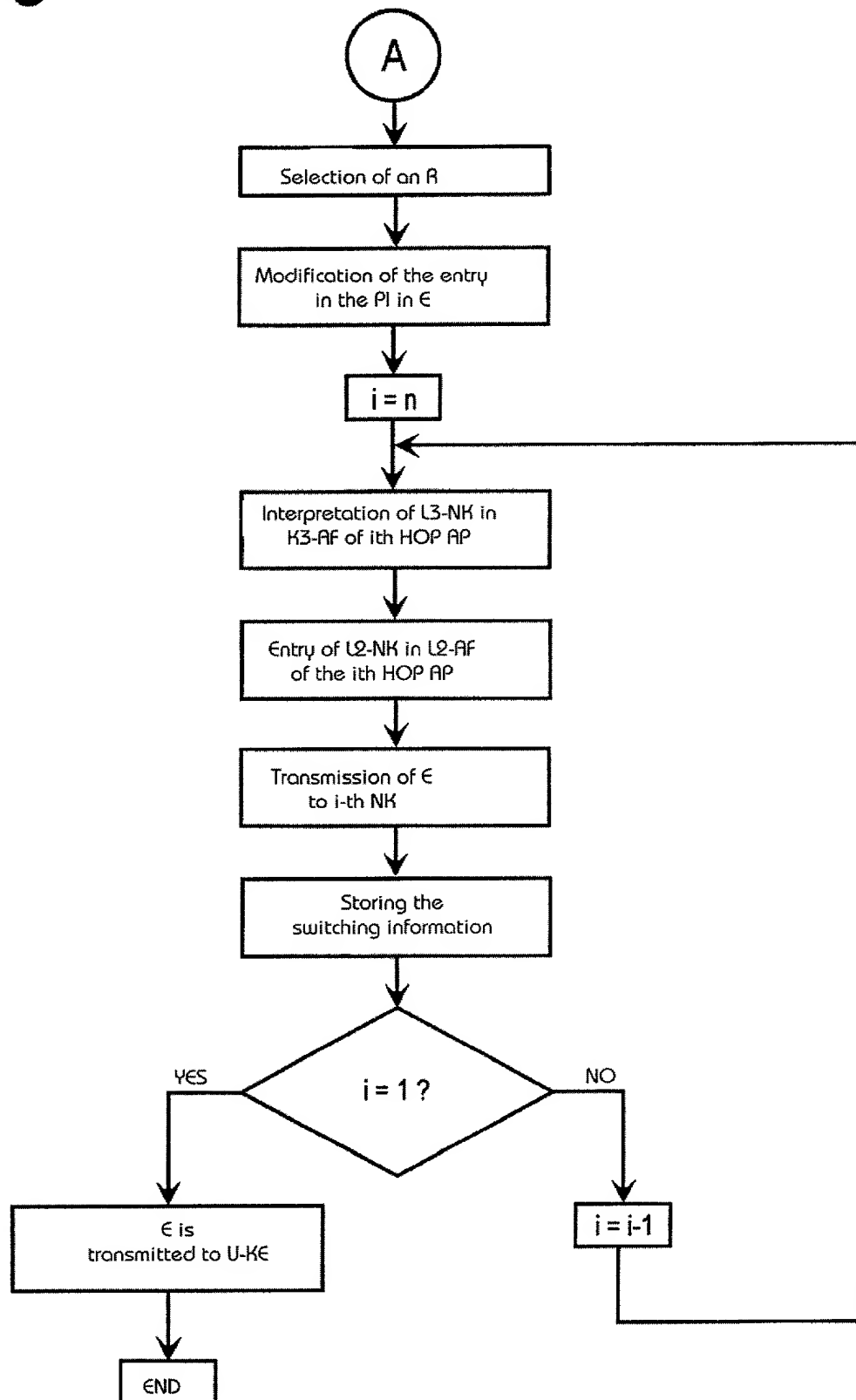


Fig 3



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Fig 4



Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Verfahren zum Einrichten eines Leitweges über ein Kommunikationsnetz

deren Beschreibung

(zutreffendes ankreuzen)

☒ hier beigefügt ist.

☐ am _____ als

PCT internationale Anmeldung

PCT Anwendungsnummer _____

eingereicht wurde und am _____

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which

(check one)

☐ is attached hereto.

☐ was filed on _____ as

PCT international application

PCT Application No. _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

09730964 010001

German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

198 29 821.8

Germany

03. Juli 1998



(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

Yes
Ja

No
Nein

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)



Yes
Ja

No
Nein

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)



Yes
Ja

No
Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date)
(Anmeldedatum)

(Status)
(patentiert, anhängig,
aufgegeben)

(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date)
(Anmeldedatum)

(Status)
(patentiert, anhängig,
aufgeben)

(Status)
(patented, pending,
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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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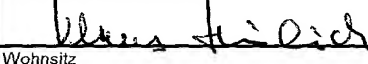
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